

REMARKS

In the Office Action mailed September 29, 2003, claims 1-3, and 22-40 were rejected. Claims 4-21 and 41-44 were objected to and would be allowable if amended to overcome the objections. Claims 1-44 are pending.

The Specification and claim 38 were objected to because of informalities.

Claim 30 was rejected under 35 USC 112, second paragraph as being indefinite and claims 31-37 were rejected as being dependent upon rejected claim 30.

Claims 38-40 were rejected under §102 in view of Hongo (6,615,854).

Claims 1-3 and 22-23 were rejected under 35 USC 103(a) as being unpatentable over Uzoh (6,056,869). Claims 24-36 were rejected under §103 as being unpatentable over Uzoh as applied to claim 22 above, and further in view of Volodarsky et al. (6,352,623). Claims 30-36 were rejected under §103 as being unpatentable over Uzoh as applied to claim 22 above, and further in view of Basol et al. (6,610,190).

Applicant respectfully traverses the rejections and amends the claims to clarify features that are not taught or suggested by the references.

Informalities and §112

Applicant correct informalities to the Specification as suggested by Examiner; with the exception of the suggestion for page 19, line 20, changing "positive" to -negative--. Instead, applicant suggests same paragraph, page 19, line 14, changing "positive" to -negative--.

Claim 38 is amended to address the awkwardly worded language "obtained from to the source".

In response to the §112 rejection, applicant amends claims 30, 32, 33, 34, 35, and 36.

Claims 23, 24, and 26 are amended to correct informalities.

It is submitted that the amendments addresses the Examiner's concerns. Accordingly, applicant requests that the informality objections and the claim rejections under 35 USC 112 be withdrawn.

§102 Rejection

Claims 38-40 were rejected under 35 USC §102 in view of Hongo et al. (6,615,854) and Mayer et al. (6,309,981).

The present invention provides a method for performing edge bevel removal and cleaning of a front face of a workpiece. As amended, claim 38 is indicative of an independent claim and recites:

...
holding a backside of the workpiece in a workpiece carrier;
rotating the workpiece;
directing a continuous stream of the solution to a bevel edge of a conductive layer of the workpiece while rotating the workpiece to electrochemically remove conductive material from the bevel edge at a first rate; and
directing a spray of the solution to the front face of the workpiece while rotating the workpiece to etch the front face of the workpiece at a second rate.

Specifically, the invention directs a continuous stream of a solution to a bevel edge while rotating the workpiece to electrochemically remove conductive material from the bevel edge at a first rate and directing a spray of the [same] solution to the front face of the workpiece while rotating the workpiece to etch the front face of the workpiece at a second rate. (emphasis added)

Neither Hongo et al. nor Mayer et al. show or suggest directing a solution to a bevel edge of a conductive layer to electrochemically remove conductive material from the bevel edge as required by the rejected claims.

Claim 39 depends from claim 38 and is patentable for its dependence on independent claim 39. Claim 39 further recites the steps of directing the stream and directing the spray are performed sequentially.

For the above reasons, applicant submits that the pending claims recite at least one feature not taught or suggested by the references. Accordingly, applicant submits that the pending claims are allowable over the references. Applicant therefore requests that the Examiner reconsider and withdraw the §102 rejections.

Commonly Owned Patents under 35 USC 103(c)

Applicant notes that the Examiner has used commonly owned patents to form some of the rejections in the Office Action. These patents should not constitute prior art because they are commonly owned and were so at the time of the invention. 35 USC 103(c).

Volodarsky – US Pat. No. 6,352,623 is assigned to NuTool, Inc. the same Assignee as the present invention.

Basol – US Pat. No. 6,610,190 is assigned to NuTool, Inc. the same Assignee as the present invention.

Applicant requests that the Examiner withdraw these references as prior art. Applicant addresses the merits of the rejections below.

§103 Rejection

Claims 1-3 and 22-23 were rejected under §103 as obvious as being unpatentable over Uzoh (6,056,869). Claims 24-36 were rejected under §103 as being unpatentable over Uzoh as applied to claim 22, and further in view of Volodarsky et al. (6,352,623). Claims 30-36 were rejected under §103 as being unpatentable over Uzoh as applied to claim 22, and further in view of Basol et al. (6,610,190).

Under the Graham test, three factors must be evaluated: the scope and content of the prior art; the differences between the prior art and the claimed invention; and the level or ordinary skill in the art. (MPEP 706 and 2141 et seq.).

A. Cited References

Uzoh discloses holding the frontside/top of the wafer in a vacuum chuck that includes various outlets for directing nitrogen and/or deionized water to the top of the wafer to protect the frontside from spray exhaust or electrolyte emanating from the backside of the wafer. (See col. 5, lines 53 – col. 6, lines 5 and fig. 3a). Accordingly, Uzoh not only does not suggest holding the backside of the wafer during deplating but also teaches away from exposing the frontside of the wafer to possible etching solution during deplating. Applicant submits that claim 1 is not taught or suggested by Uzoh and is patentable over the Uzoh reference.

B. Pending Claims

Among other distinctive recitations, independent claim 1, as amended, sets forth holding a backside of the workpiece using a workpiece carrier and directing a continuous stream of the etching solution to the bevel edge of the workpiece, including the front edge surface of the conductive layer. Uzoh on the other hand is concerned with unwanted metal that may remain on the side edge and backside of the wafer in discontinuous deposits. (See col. 4, lines 16-18). Consequently, the Uzoh invention includes a small, compact, high-speed wafer edge and backside metal deplater. (Col. 4, lines 28-29) Restated “[t]he present invention also includes a

method for electrochemically deplating metal from edges and backside of a semiconductor wafer” (Col. 9, lines 4-6).

Dependent claims 2-3 are also patentable by virtue of their dependence on claim 1. Applicant submits that claims 1-3 are not taught or suggested by Uzoh and are allowable over the Uzoh reference.

Independent claim 22 recites, among other distinctive recitations, a movable and rotatable workpiece holder that holds a backside of the workpiece and rotates the workpiece and at least one edge conductor material removal device for supplying a continuous stream of an etching solution toward at least the front conductive surface edge of the workpiece. Uzoh does not teach or suggest a workpiece holder that holds a backside of the workpiece and an edge conductor material removal device for supplying a continuous stream of an etching solution toward at least the front conductive surface edge of the workpiece. Moreover, Uzoh teaches away from exposing the front conductive surface to possible etching solution during deplating. Applicant submits that claim 22, as amended, is not taught or suggested by the references. Accordingly, applicant requests that the Examiner reconsider and withdraw the rejection.

Claim 23 depends from claim 22 and further recites “at least one edge conductor material removal device comprises at least one nozzle disposed within a position relative to the workpiece such that a continuous stream of the etching solution is directed outwardly toward the front conductive surface edge of the workpiece.” Applicant submits that claim 23 in combination with claim 22 is not taught or suggested by the references. Accordingly, applicant requests that the Examiner reconsider and withdraw the rejection.

Claims 24-29 were rejected under §103 in view of Uzoh and Volodarsky. Applicant submits that since Volodarsky is commonly owned and does not constitute prior art under the law, that this rejection is overcome. Accordingly, applicant requests that the Examiner reconsider and withdraw the rejection.

Claims 30-36 were rejected under §103 in view of Uzoh and Basol. Applicant submits that since Basol is commonly owned and does not constitute prior art under the law, that this rejection is overcome. Accordingly, applicant requests that the Examiner reconsider and withdraw the rejection.

Skill in the art does not provide the differences between the references and the claimed invention. An engineer skilled in the art would not develop the claimed invention with these references and skill in the art.

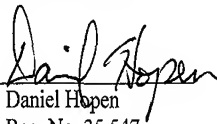
For these reasons, applicant submits that the claimed invention is not taught or suggested by the references alone or in combination. Accordingly, applicant submits that the pending claims are allowable over the references. Applicant therefore requests that the Examiner reconsider and withdraw the §103 rejections.

Conclusion

Applicant has amended the claims to further clarify features that are not taught or suggested by the references. For these reasons, applicant respectfully requests that the Examiner reconsider and withdraw the rejections of the claims.

If any matters can be resolved by telephone, applicant requests that the Patent and Trademark Office call the applicant at the telephone number listed below.

Respectfully submitted,

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